

CLAIMS

1. A shoulder press exercise machine, comprising:

2 a main frame having a user support pivot mount, a forward end and a
rear end;

4 a user support pivotally mounted on the user support pivot mount for
supporting a user in a seated position and movable between a start position
6 and an end position;

 at least one exercise arm movably mounted on the frame, the exercise
8 arm having user engagement means for gripping by a user in performing a
shoulder press exercise, the exercise arm being movable between a start
10 position in which the user engagement means is located in front of the
shoulders of a user in a seated position on the user support frame in the start
12 position of the user support frame and an end position higher than the start
position in which the user engagement means is located above the head of
14 the user with the user support frame in the end position;

 a connecting linkage comprising means for connecting movement of
16 the exercise arm to movement of the user support, whereby movement of the
exercise arm from the start to the end position simultaneously rotates the
18 user support from the start to the end position; and

 a load for resisting movement of at least one of the moving parts of the
20 machine;

 whereby the combined motion of the user, user support frame and
22 user engagement means between the start and end position substantially
replicates the natural movement of the upper part of a human body when
24 performing a free weight shoulder press exercise.

2. The machine as claimed in claim 1, wherein the user support has a seat

2 pad and a back pad, the seat pad and back pad traveling in a fixed
relationship relative to one another throughout the exercise movement.

- 2 3. The machine as claimed in claim 2, wherein the start position of the user support is a rearwardly reclined position.
- 2 4. The machine as claimed in claim 3, wherein the end position of the user support is more rearwardly reclined position than the start position.
- 2 5. The machine as claimed in claim 3, wherein the user support has a seat portion and a back rest portion, the user support in the end position being positioned upwardly and forward from the start position with the back rest
4 portion more reclined than in the start position.
- 2 6. The machine as claimed in claim 2, wherein the user support further includes a foot plate for supporting the user's feet on the user support throughout the exercise movement.
- 2 7. The machine as claimed in claim 2, wherein the seat pad is adjustable in height.
- 2 8. The machine as claimed in claim 1, including a foot rest mounted on the main frame in front of the user support for supporting the user's feet during an exercise movement.
- 2 9. The machine as claimed in claim 1, wherein the exercise arm is moveably mounted on the frame for rotation about an exercise arm pivot.
- 2 10. The machine as claimed in claim 9, wherein the exercise arm pivot is positioned rearward of the user support.
- 2 11. The machine as claimed in claim 9, wherein the user support rotates in the same direction as the exercise arm.

12. The machine as claimed in claim 1, wherein the exercise arm is moveably
2 mounted on the frame for movement in a linear path.

13. The machine as claimed in claim 12, wherein the main frame has an
2 inclined strut located behind said user support, and the exercise arm has a
central portion movably mounted for movement along said strut between the
4 start and end positions, and has arm portions projecting forward from said
central portion on opposite sides of said user support, said user engaging
6 means comprising handles at the ends of said arm portions.

14. The machine as claimed in claim 1, wherein the user support pivot mount
2 is positioned at a predetermined location under the user support frame and
beneath the user's body when supported on the frame, the pivot mount
4 defining a vertical, gravitational center line, whereby movement of the user
engagement device in an exercise movement simultaneously moves the user
6 support frame between a start position and an end position, the user support
pivot mount being positioned such that portions of the combined weight of the
8 user and user support frame are distributed on each side of the gravitational
centerline of the pivot mount in both the start and end position and only a
10 portion of the combined weight passes through the gravitational centerline
during the exercise movement.

15. The machine as claimed in claim 14, wherein the user support pivot
2 mount is located behind the hips of a user seated on the user support.

16. The machine as claimed in claim 14, wherein approximately 75% of the
2 total weight of the user and user support is positioned in front of the
gravitational centerline in the start position and approximately 50% of the total
4 weight is located on each side of the centerline in the end position.

17. The machine as claimed in claim 1, wherein the user support frame has a
2 primary user support and a secondary user support held in fixed relative
locations throughout an exercise movement, the primary support comprising a
4 seat pad.

18. The machine as claimed in claim 17, wherein the secondary support
2 comprises a back pad.

19. The machine as claimed in claim 1, wherein the user support frame
2 defines an initial position for the user's body when supported on the frame in
the start position of the exercise, and a finish position for the user's body in
4 the end position of the exercise, the user support pivot mount defining a
gravitational centerline extending through the user's body in each of said user
6 positions.

20. The machine as claimed in claim 19, wherein the gravitational centerline
2 extends through the user's body adjacent the hips in the end position, and
through the user's shoulders in the start position.

21. The machine as claimed in claim 1, wherein the main frame has a base
2 and the user support pivot mount is mounted on the base.

22. The machine as claimed in claim 1, wherein the exercise arm comprises a
2 single rigid exercise arm having opposite arm portions extending on opposite
sides of the user support, the arm portions having outer ends, and said user
4 engaging means comprising angled handles at the outer ends of said arm
portions.

23. The machine as claimed in claim 1, wherein a pair of independently
2 movable exercise arms are movably mounted on the frame, each exercise

4 arm having a user engagement means for engagement by a respective one of
the user's hands.

2 24. The machine as claimed in claim 1, wherein the connecting link is a rigid
link.

2 25. The machine as claimed in claim 24, wherein the connecting link has a
first end pivoted to said exercise arm and a second end pivoted to said user
support frame.

2 26. The machine as claimed in claim 25, wherein the user support has a seat
portion and a backrest portion, and the second end of the connecting link is
pivoted to said backrest portion.

2 27. The machine as claimed in claim 25, wherein the user support has a seat
portion and a backrest portion, and the second end of the connecting link is
pivoted to said seat portion.

2 28. The machine as claimed in claim 24, wherein the connecting link is
adjustable in length.

2 29. The machine as claimed in claim 1, including a movable member movably
mounted on said user support frame, the connecting link having a first end
pivoted to said movable member and a second end pivoted to said exercise
4 arm.

2 30. The machine as claimed in claim 1, wherein the connecting link comprises
a first gear toothed cam mounted on said user engagement device, a second
gear toothed cam mounted on said user support frame, and a sprocket
4 rotatably mounted on said frame and meshing with said first and second gear

6 toothed cams so as to link movement of said user engagement device with
movement of said user support frame.

2 31. The machine as claimed in claim 1, wherein the connecting link comprises
a moving wedge member movably engaged with said main frame and user
4 support frame, and said exercise arm is linked to said moving wedge
member.

2 32. The machine as claimed in claim 1, wherein the connecting link comprises
a cable and pulley linkage.

2 33. The machine as claimed in claim 1, wherein the connecting link comprises
a movable member movably mounted on said main frame, a first linkage
connecting said movable member to said user support, and a second linkage
4 connecting said movable member to said exercise arm.

2 34. The machine as claimed in claim 1, wherein the connecting link comprises
a multiple bar linkage between said user support, exercise arm, and main
frame.

2 35. The machine as claimed in claim 1, wherein the load comprises a
selectorized weight stack.

2 36. The machine as claimed in claim 1, wherein the load comprises weight
plates.

2 37. The machine as claimed in claim 1, wherein the load is linked to said user
support frame.

2 38. The machine as claimed in claim 1, wherein the load is linked to said
exercise arm.

2 39. The machine as claimed in claim 1, wherein the load is linked to said connecting link.

2 40. The machine as claimed in claim 1, wherein the main frame has a base
and a rear upright at the rear end of the base, the exercise arm being
movably mounted on said rear upright and having arm portions projecting
4 forward on opposite sides of said user support.

2 41. The machine as claimed in claim 1, wherein said user support is L-
shaped, having a seat supporting base and an upright back support member
and a junction between the base and upright back support member.

2 42. The machine as claimed in claim 41, wherein the user support pivot
mount is located adjacent the junction of said base and upright back support
member.

2 43. The machine as claimed in claim 41, wherein said user support pivot
mount is pivotally secured to said upright back support of said user support.

2 44. The machine as claimed in claim 43, wherein said upright back support
member has an upper end, the user support pivot mount being pivotally
connected to the upper end of said upright back support member.

2 45. A shoulder press exercise machine for performing exercises equivalent to
a free weight shoulder press exercise, comprising:
a main frame having a forward end and a rear end;
4 a user support pivot mount on the main frame;
a user support frame pivotally mounted on the user support pivot
6 mount, the user support frame comprising one moving part of the machine,

and having a seat portion and a back rest portion which travel in a fixed
8 relationship throughout an exercise movement;
at least one exercise arm movably mounted on one of the frames for
10 engagement by the user in performing exercises, the exercise arm having a
user engaging handle, and comprising a second moving part of the machine;
12 a connecting link movably engaged with at least two of the main frame,
user support frame and exercise arm for linking movement of the exercise
14 arm to movement of the user support frame, the connecting link comprising a
third moving part of the machine;
16 a load for resisting movement of at least one of the moving parts of the
machine; and
18 whereby the combined motion of the user, user support frame and
user engagement means between the start and end position substantially
20 replicates the natural movement of the upper part of a human body when
performing a free weight shoulder press exercise.

46. The machine as claimed in claim 45, wherein the exercise arm and
2 user support frame are positioned relative to one another in the end position
such that the handle is located directly above the head of the user seated on
4 the user support frame, whereby the user's arms extend straight above their
head and in line with the side centerline of their body in the exercise end
6 position.